What is claimed is:

1. An image sensor device, comprising:

a substrate having a photodiode formed therein, and a plurality of transistors formed on the substrate, the photodiode being electrically associated with the transistors;

at least one lower contact formed on source/drain regions and gates of the transistors;

at least one electrical interconnection line formed on the at least one lower contact and being electrically associated with the photodiode;

a light passageway having a light inlet, the light passageway being positioned in alignment with the photodiode;

a color filter positioned over the light inlet of the light passageway; and

a lens positioned over the color filter in alignment with the light passageway,

wherein the at least one electrical interconnection line includes a copper interconnection formation running through a plurality of interlayer dielectric layers in a stacked configuration with a diffusion barrier layer between adjacent interlayer dielectric layers, and a barrier metal layer between the copper interconnection formation and the plurality of interlayer dielectric layers and intervening diffusion barrier layers.

2. An image sensor device as claimed in claim 1, further comprising a first protection layer covering an uppermost surface of the copper interconnection.

3. An image sensor device as claimed in claim 2, wherein the first protection layer is formed of at least one selected from the group consisting of SiC, SiN, SiO2 on SiN, and SiO2 on SiC.

4. An image sensor device as claimed in claim 2, further comprising a second protection layer disposed on the first protection layer and an inner surface of the light passageway.

5. An image sensor device as claimed in claim 4, wherein the second protection layer is formed of a silicon oxide series material.

6. An image sensor device as claimed in claim 4, wherein the second protection layer has an antireflective property at a bottom of the light passageway.

7. An image sensor device as claimed in claim 1, wherein the lower contact is formed of one selected from the group consisting of copper, tungsten and titanium.

8. An image sensor device as claimed in claim 7, wherein when the lower contact is formed of copper, a barrier metal layer is interposed between the lower contact and the first of the plurality of interlayer dielectric layers.

9. An image sensor device as claimed in claim 1, further comprising an antireflection layer formed on the substrate having the photodiode, the plurality of transistors and the isolation region.

10. An image sensor device as claimed in claim 1, further comprising an antireflection layer patterned on the photodiode under the light passageway.

11. An image sensor device as claimed in claim 1, wherein the light passageway is filled with a transparent material.

12. An image sensor device as claimed in claim 11, wherein the transparent material is a spin-on-glass or a photoresist.

13. An image sensor device as claimed in claim 1, wherein the lens is a convexly shaped micro lens.

14. An image sensor device as claimed in claim 1, further comprising a barrier metal layer on sidewalls of the light passageway.

protection layer covering an uppermost surface of the copper interconnection.

15. A method for forming an image sensor device, comprising:

forming a photodiode in a substrate;

forming an isolation region in the substrate to a first side of the photodiode;

forming a plurality of transistors on the substrate to a second side of the photodiode, the transistors having source/drain regions and a gate;

forming on the substrate having the photodiode an interlayer dielectric structure having a plurality of alternately stacked interlayer dielectric layers and diffusion barrier layers with an uppermost layer being an interlayer dielectric layer, and concurrently forming at least one electrical connection line formed of a metal interconnection within a barrier metal layer through the alternately stacked interlayer dielectric layers and diffusion barrier layers to be electrically associated with the photodiode and the plurality of transistors;

forming a light passageway having a light inlet in alignment with the photodiode by removing portions of the interlayer dielectric structure over the photodiode;

forming a color filter over the light inlet of the light passageway; and

forming a lens over the color filter to be in alignment with the light passageway.

16. The method for forming an image sensor device as claimed in claim 15, wherein forming the interlayer dielectric structure and the light passageway further comprise:

A. forming a first interlayer dielectric layer of a transparent material on the substrate having the photodiode, the isolation region and the plurality of transistors;

B. patterning the first interlayer dielectric layer to form contact holes over source/drain regions and gates of the transistors;

C. filling the contact holes with metal to form lower contacts;

D. sequentially forming a first diffusion barrier layer and a second interlayer dielectric layer on the first interlayer dielectric layer;

E. patterning the second interlayer dielectric layer and the first diffusion barrier layer to form via holes over the lower contacts;

F. patterning the second interlayer dielectric layer to form trenches over the via holes;

G. forming a barrier metal layer in the via holes and trenches;

H. filling the via holes and the trenches with copper to form a copper interconnection;

I. repeating D-H to form the interlayer dielectric layer structure having a predetermined number of layers;

J. forming a first protective layer on the copper interconnection in the uppermost interlayer dielectric layer before forming the light passageway;

K. filling the light passageway with a transparent material before forming the color filter and the lens.

17. The method for forming an image sensor device as claimed in claim 16, wherein forming the light passageway comprises:

sequentially etching a portion of each interlayer dielectric layer and diffusion barrier layer at a position over the photodiode down to the first interlayer dielectric layer.

18. The method for forming an image sensor device as claimed in claim 16, further comprising:

patterning the second interlayer dielectric layer and the first diffusion barrier layer to also form a dummy hole over the photodiode in E;

forming the barrier metal layer in the dummy hole in G; and

filling the dummy hole with copper to form a copper dummy pattern in addition to the copper interconnection in H.

19. The method for forming an image sensor device as claimed in claim 18, wherein forming the light passageway comprises:

performing an etching process to remove the copper dummy patterns positioned over the photodiode; and

removing the barrier metal layer remaining on a bottom and sidewalls of the light passageway.

20. The method for forming an image sensor device as claimed in claim 16, further comprising:

patterning the second interlayer dielectric layer and the first diffusion barrier layer to also form two dummy holes over opposite ends of the photodiode in E, thereby forming an interlayer dielectric dummy pattern over the photodiode in between the two dummy holes;

forming the barrier metal layer in the dummy holes in G; and

filling the dummy holes with copper in H.

21. The method for forming an image sensor device as claimed in claim 20, wherein forming the light passageway comprises:

performing a wet etching process on the copper in the dummy holes, thereby removing the copper in the dummy holes and the interlayer dielectric dummy patterns.

22. The method for forming an image sensor device as claimed in claim 21, further comprising:

etching the interlayer dielectric dummy pattern while etching the trenches in F, such that the interlayer dielectric dummy pattern has a height equal to a depth of the trenches.

23. The method for forming an image sensor device as claimed in claim 22, wherein forming the light passageway comprises:

performing a wet etching process on the copper in the dummy holes, thereby removing the copper in the dummy holes and the interlayer dielectric dummy patterns.

24. The method for forming an image sensor device as claimed in claim 20, wherein widths of the two dummy holes and the via holes are the same.

25. The method for forming an image sensor device as claimed in claim 16, wherein H comprises:

forming a copper layer on the interlayer dielectric layer to fill the via holes and trenches; and

planarizing the copper layer by chemical mechanical polishing to expose a surface of the underlying interlayer dielectric layer.

26. The method for forming an image sensor device as claimed in claim 16, further comprising:

in C, if the metal is copper, forming a barrier metal layer in the contact holes before filling the contact holes with the metal.

27. An image sensor device, comprising:

a substrate having a photodiode formed therein;

an interlayer dielectric structure having at least one opaque layer and a light passageway which passes through the opaque layer, the light passageway being positioned in alignment with the photodiode;

a transparent dielectric layer which fills the light passageway;

a color filter positioned over a light inlet of the light passageway; and

a lens positioned over the color filter in alignment with the light passageway.

28. An image sensor device as claimed in claim 27, wherein the transparent dielectric layer material is a spin-on-glass or a photoresist.

29. An image sensor device as claimed in claim 27, wherein the interlayer dielectric structure has a copper contact for a copper interconnection formed therein; and

the opaque layer is a copper diffusion barrier layer to prevent diffusion of the copper of the copper interconnection and the copper contact.

30. An image device as claimed in claim 27, further comprising a first interlayer dielectric layer between the substrate and the interlayer dielectric structure to cover the photodiode formed in the substrate.

31. An image device as claimed in claim 27, further comprising a protection layer which is formed on sidewalls of the light passageway.

32. An image device as claimed in claim 31, wherein the protection layer is made of anti-reflection materials.

33. An image device as claimed in claim 27, further comprising a barrier metal layer on sidewalls of the light passageway.